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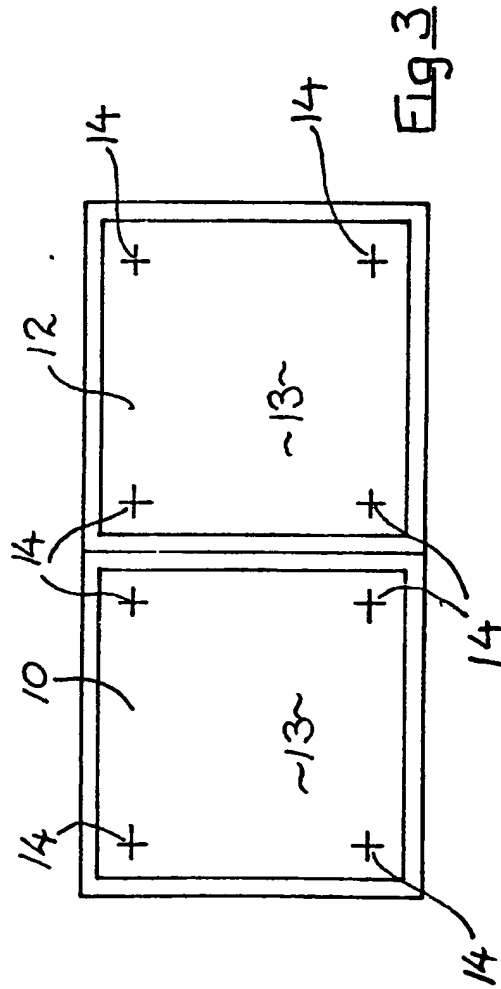
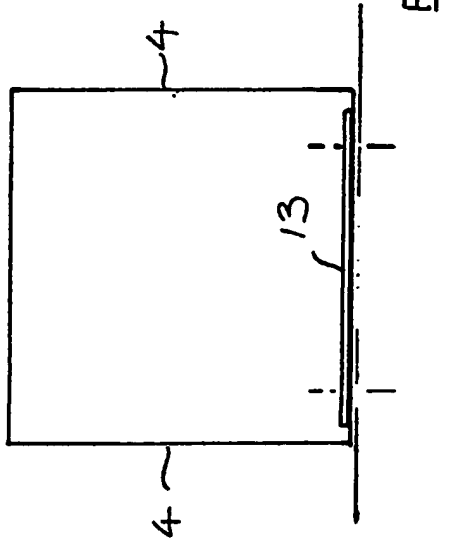
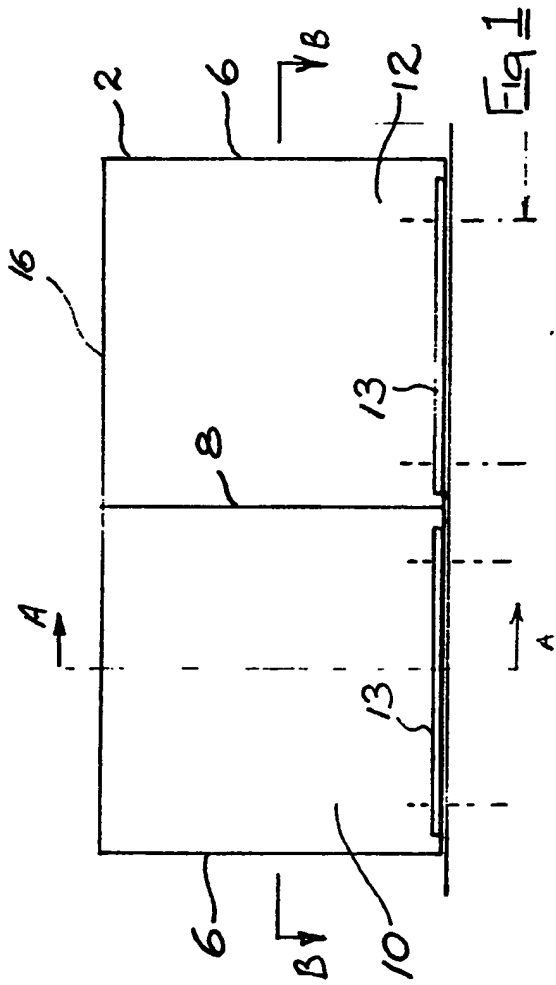
(58) Field of search
UK CL (Edition J) E1G
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(54) Crash barrier

(57) A crash barrier is formed of a gabion filled with lumps of resilient, frangible or crushable material. The gabion is suitably formed from plastics or steel mesh, the latter being welded or woven. The base of each gabion may be weighted in order to hold it to the ground.

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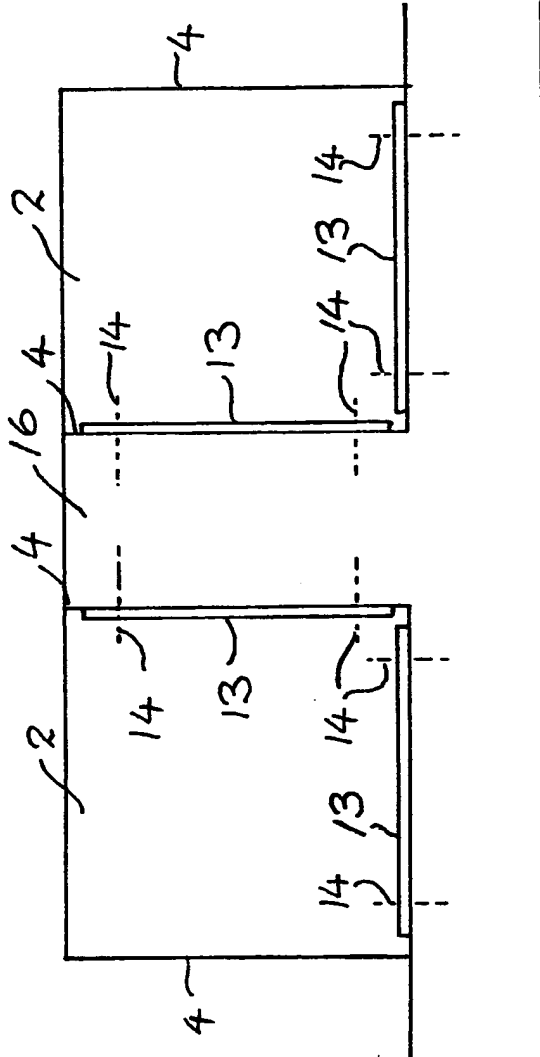


Fig 4

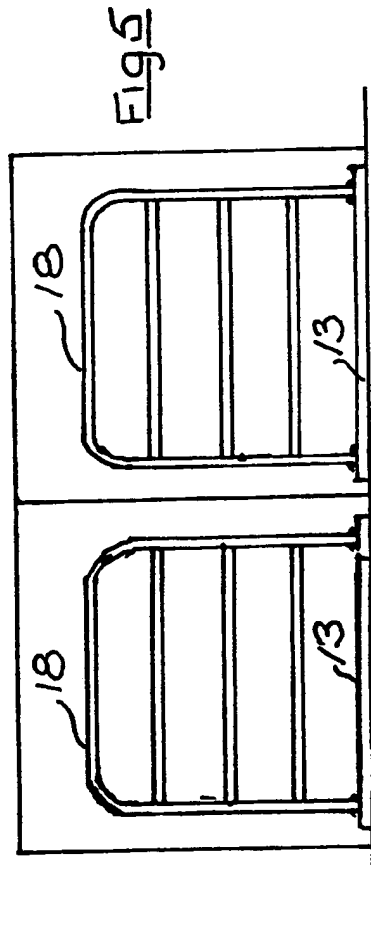


Fig 5

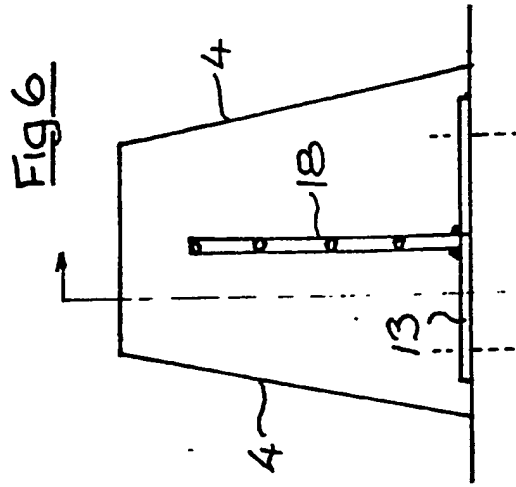


Fig 6

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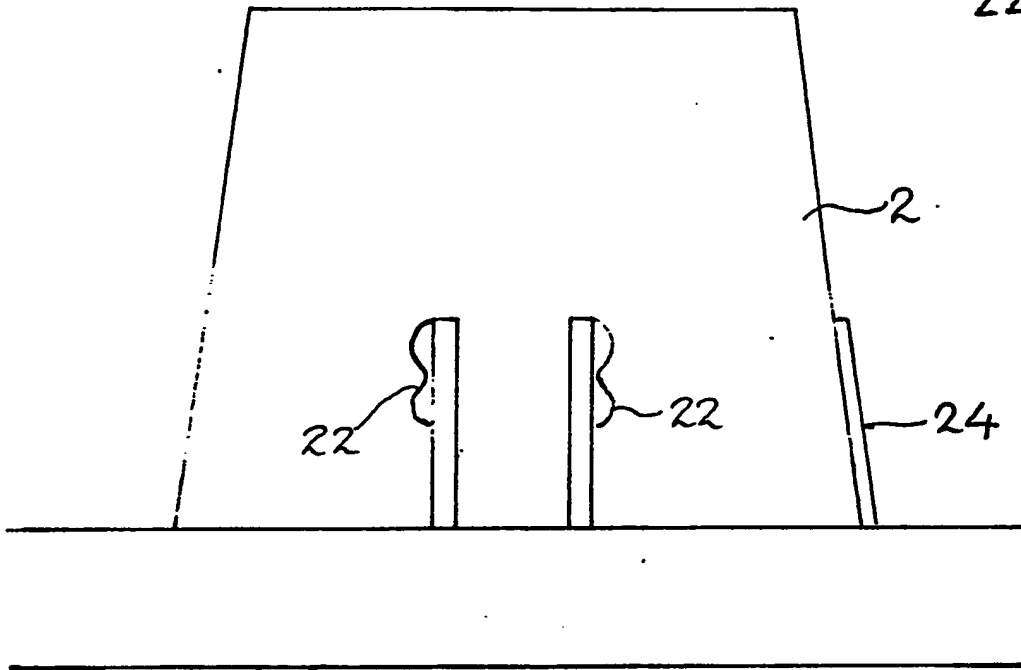


Fig 7

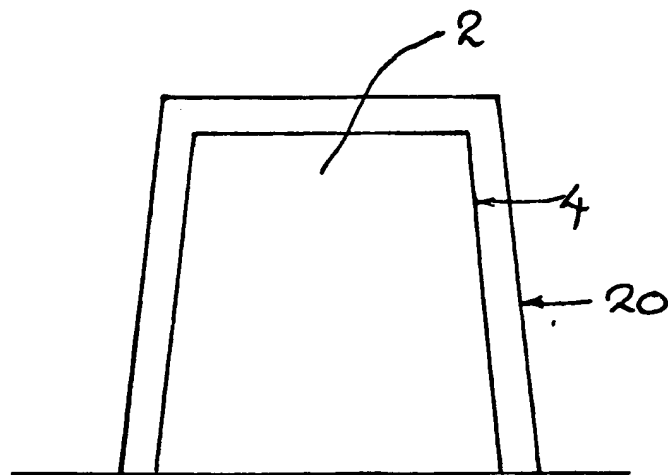


Fig 8

CRASH BARRIERS

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FIELD OF THE INVENTION

This invention relates to crash barriers.

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BACKGROUND OF THE INVENTION

Crash barriers are used on motorways and roads to prevent cars from leaving the carriageway. For example they are used in the central reservation of motorways. The usual
10 forms of crash barrier are effective only for motor cars, not being effective for heavy commercial traffic or even, in some situations, for vans, due to the barriers' low height and insufficient strength. Higher stronger crash barriers have been proposed, but the proposals are expensive and provide
15 very rapid deceleration to light vehicles such as motor cars.

SUMMARY OF THE INVENTION

In accordance with the invention there is provided a crash barrier comprising a gabion filled with lumps of
20 material such as to allow the gabion to deform in a crash. For a permanent barrier, the gabion is secured to the ground, then filled with lumps of the filling material. Examples of suitable fillings are resilient fillings e.g. used car and/or truck tyres (whole or cut up), or plastics or rubber lumps.
25 Other examples are frangible fillings e.g. lumps of low strength concrete, which may include lumps of plastics foam. The gabions may be inexpensively made of a size suitable to stop heavy commercial vehicles, yet if filled with suitable resilient or frangible material, will crumple sufficiently on
30 impact to be safe for light vehicles.

To facilitate clearing up and to improve strength, the lumps of filling may be bound with plastics foam.

To improve appearances, the gabion may be sprayed with a grass seed/papier mache mixture.

35 A rigid concrete core may be used to increase strength or the gabion may be installed over an existing Armco barrier.

BRIEF DESCRIPTION OF THE DRAWINGS

One embodiment of the invention will now be described, by way of example, with reference to the accompanying drawings, in which:

5 Figure 1 is a cross section of a barrier embodying the invention, the filling not being shown for clarity;

 Figure 2 is a cross section on arrows "A-A" of Figure 1;

 Figure 3 is a cross section on arrows "B-B" of Figure 1;

 Figure 4 is a cross section of an alternative
10 installation of a crash barrier embodying the invention;

 Figure 5 is a longitudinal cross section of an alternative embodiment of the invention;

 Figure 6 is a transverse cross section of the embodiment of Figure 5;

15 Figure 7 is a cross section of a crash barrier embodying the invention, installed over an existing Armco crash barrier; and

 Figure 8 is a cross section of another crash barrier embodying the invention.

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DETAILED DESCRIPTION

Referring to Figures 1 to 3, the gabion is in the form of a mesh cuboid 2, which is 2 metres by 1 metre by 1 metre. The mesh may be woven or welded steel wire, or plastics and
25 is usually delivered flat. To assemble, side panels 4 and end panels 6 are raised to form a box. The top corners of the box are clipped together. A mesh divider panel 8 is inserted to divide the box into two equal sections 10 and 12. Then all the vertical intersections of the panels are
30 clipped together along their lengths. In the base of each of the two sections 10 and 12 is a 12 mm galvanised steel 13 plate through which the gabion is fixed to the ground using expanding bolts on centres 14. Adjacent gabions are clipped to each other. The gabion is filled with lumps of filling
35 material (not shown) and a mesh top panel is then clipped on.

 The object in choosing a suitable filling is to ensure that the barrier will stop a heavy goods vehicle, while

ensuring that there is sufficient deformation to be safe, when hit by a light motor car. Examples of suitable materials are resilient materials e.g. used vehicle tyres, either whole or cut up, or rubber or plastics lumps. Other
5 examples are frangible materials e.g. low strength concrete lumps or cement and sawdust aggregate. To decrease the strength of the concrete lumps, foam particles may be included in the concrete mix. Yet further suitable filler materials include crushable lumps, for example used drinks
10 cans preferably aluminium.

Manufacture and installation of gabions as crash barriers would be inexpensive and, in the dimensions given, would prevent head lamp glare between opposing carriageways.

The strength of the barrier could be increased by
15 binding the lumps together with a plastics foam. This would also facilitate cleaning up after an accident. Fire resistance could be improved by spraying with "Rock Fill" fire retarding agent.

The crash barriers improve the safety to light cars in
20 situations where concrete crash barriers already exist. Thus in Figure 4 a gabion is mounted on each side of a concrete crash barrier 16. Each gabion has additional steel plates 13 to secure a side panel 4 to the concrete crash barrier.

Figures 5 and 6 show an embodiment in which the strength
25 is increased by an internal framework 18 welded down the centre of the gabion to the floor plates 13. As may be seen from Figure 6 the side panels 4 of the gabion need not be vertical. Their function and/or appearance may be improved by sloping side panels 4 which may slope inwardly towards the
30 top (as illustrated) or outwardly.

The appearance may be further improved by spraying with a mixture of grass seed and papier mache, so that they become covered in grass, or by plastering with a sand and cement skin 20 as illustrated in Figure 8.

35 Figure 7 Shows how the barrier may be installed over an existing "Armco" crash barrier 22 improving the performance thereof to heavy vehicles whilst remaining safe in impacts by

lighter vehicles. A slip strip may be provided to guide vehicles impacting at a shallow angle back onto the carriageway.

For temporary barriers, the gabion box is assembled, PVC sheet is placed in the bottom which is then filled with concrete to a depth of, say, 4 inches, the gabion is filled with lumps of a suitable filling material, and the top is fitted.

To speed construction, the gabions could be made 4 metres long.

The crash barrier could be used around dangerous structures, e.g. bridges, at the side of a carriageway, as well as in the central reservation. In such places, the barrier could be several meters deep, providing great energy absorption in a crash.

Alternative ground fixings include ground anchors and breakable snap fixings. The breakable snap fixings would allow the gabions to move at a predetermined loading in a crash then, being clipped together, would act like an arrester wire, which would further reduce damage to the vehicle.

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CLAIMS

1. A crash barrier comprising a gabion filled with lumps of material such as to allow the gabion to deform in a crash.
- 5 2. A crash barrier as claimed in claim 1, wherein the gabion is formed of steel mesh.
3. A crash barrier as claimed in claim 2, wherein the mesh is welded.
4. A crash barrier as claimed in claim 2, wherein the
10 mesh is woven.
5. A crash barrier as claimed in claim 1, wherein the gabion is formed of plastics mesh.
6. A crash barrier as claimed in any preceding claim, wherein the filling is resilient.
- 15 7. A crash barrier as claimed in claim 6, wherein the filling is used car and/or truck tyres (whole or cut up), or plastics or rubber lumps.
8. A crash barrier as claimed in any of claims 1 to 5, wherein the filling is frangible.
- 20 9. A crash barrier as claimed in claim 8, wherein the filling is lumps of low strength concrete.
10. A crash barrier as claimed in claim 9 wherein the concrete includes lumps of plastics foam.
11. A crash barrier as claimed in any of claims 1 to 5
25 wherein the filling is crushable.
12. A crash barrier as claimed in claim 11, wherein the filling is used drinks cans.
13. A crash barrier as claimed in any preceding claim, wherein the lumps of filling are bound with a plastics foam.
- 30 14. A crash barrier as claimed in any preceding claim, which has been sprayed with a grass seed/papier mache mixture.
15. A crash barrier as claimed in any preceding claim, including a rigid concrete core.
- 35 16. A crash barrier as claimed in any of claims 1 to 14, installed over an existing Armco barrier.
17. A crash barrier as claimed in any preceding claim

including a skin of sand and cement concrete.

18. A crash barrier as claimed in any preceding claim, including a steel facing strip to guide vehicles impacting at a shallow angle, back on the carriageway.

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